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WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE FISH AND WILDLIFE SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

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Chicago, Ill. No. 38 October, 1943

WILSON ORNITHOLOGICAL CLUB

Bibliography

Van Cleave, Harley J. An index to the opinions rendered by the International Commission on Zoological Nomenclature, American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 30(1), July 1943, pp. 223-240.

Index to significant topics, including taxonomic principles and the names of authorities and of organisms, in the 133 published opinions of the Commission (1907-1936).

Classification: Grouse, Ruffed

Aldrich, John W., and Herbert Friedmann. A revision of the ruffed grouse, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 45(3), May-June 1943, pp. 85-103, Figs. 26-27 (maps).

Discussion of variation and its ecological correlation in Bonasa umbellus. Key to 12 subspecies, with synonymy, description of plumages (by sex and age classes when possible), measurements, and statement of distribution of each. Bibliography of 26 titles.

Classification: Larks, Horned

Behle, Wm. H. Distribution and variation of the horned larks (Otocoris alpestris) of western North America, Univ. of California Publ. in Zoology (University of California Press, Berkeley. $1.25 a copy), 46 (3), pp. 205-316, 13 figs. (maps and graphs), 1942.

Report upon a thorough study of western horned larks for which a great deal of material was assembled and collecting done to assure representation of all critical areas. Life history is briefly sketched and molts and plumages discussed at some length. The accounts of the subspecies (14) include: synonymy, notes on the type and type locality, diagnosis, measurements, statement of distribution, conspectus of specimens examined, list of the localities represented, habitat notes, and discussion of distribution and variation. The relationships of the races and the factors in subspeciation are given full consideration. There is a 5-1/2 page list of literature cited.

Conservation

Hicks, Lawrence E. The role of conservation in wartime, Ohio Wildlife Research Station (Ohio State University, Columbus) Release 177, 24 pp. (mimeographed), 1943.

A summary of the inter-relationships of war and conservation. The value of outdoor recreational activities is stressed and the direct value of wildlife as a source of food, fats, and hides is appraised. Social aspects of sportsman training and conservation activities are treated. The post-war role of those interested and trained in wildlife management is considered. Bibliography of 20 titles.

Conservation: Crane, Whooping

Stevenson, James O. Will bugles blow no more?, Audubon Magazine (1006 Fifth Ave., New York, N. Y. 35 cents a copy), 45(3), May-June 1943, pp. 134-139, 2 photos,

Notes on the whooping cranes in and near the Aransas National Wildlife Refuge, Texas, including local names, food and other habits, and hazards to their existence. Discussion of what can be done to save the species from extinction.

Conservation: Hawks

Pearson, T. Gilbert. What about hawks?, Field & Stream (515 Madison Ave., New York, N. Y. 20 cents a copy), 48(2), June 1943, pp. 20-21, 69, 3 photos (one a portrait of author), 3 line drawings.

Discussion of the unsatisfactory working of bounty laws in North Carolina, Virginia, and Pennsylvania and of evidence as to the food habits of hawks. Public sentiment relating to these birds has been very slow to change.

Conservation: Wildlife in national parks

Anon. Wildlife conditions in national parks 1941, National Park Service (U. S. Dept. of the Interior, Chicago, Ill.), 58 pp., photos, tables (processed), May 1943.

This revision of the 1939 report comments upon wildlife and its management in 39 of the more important national parks and monuments. It discusses in greatest detail the Yellowstone elk and bison herds, the Olympic elk, and the Dall sheep and wolves of Mount McKinley National Park. Estimates are given in terms of relative abundance or in figures of the populations of large and medium sized mammals in 25 parks and 31 monuments. Separate chapters are devoted to park wildlife in wartime and to elk herd regulation, Yellowstone National Park, 1942-43. A statement of the general wildlife policy of the National Park Service is reprinted.

Control: Fire ant

Travis, Bernard V. Further tests with thallium baits for control of the fire ant, Journ. of Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 36(1), 1943, pp. 56-58, 1 table.

In this fifth paper (references to the four earlier ones are given) on the control of fire ants as destroyers of quail eggs, the writer reports the results of additional experiments. Both the acetate and sulfate of thallium were found effective in one percent solutions in syrup. This was exposed pure in small cans and mixed with either sawdust or excelsior. The can method with thallium acetate was most efficient, but on account of lower cost the use of a sawdust bait may be preferable as a field method.

Control: Rat

Sherrard, G. C. A plan for rodent control in cities, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(22), May 28, 1943, pp. 825-832.

The administrative steps, procedures, and activities essential to success are discussed in considerable detail. Control measures indicated are: Ratproofing, elimination of waste material, proper storage of goods, trapping, fumigating, and poisoning. Author's summary: "Rodent control, like other important public health measures, requires foresighted planning if expectations are to be realized. The solution of the problem will be found in the continuous application of control measures rather than in evanescent campaigns. Preconceived ideas concerning results to be obtained by poisoning and trapping of rats must be discarded in favor of the slower and more difficult method of 'building them out,' i.e., ratproofing. At the same time food supplies must be made inaccessible, thereby serving the double purpose of depriving rodents of sustenance and conserving commodities vitally needed for human consumption. Special emphasis has been placed on ratproofing and harborage elimination for the reason that this plan is designed for use in cities where the objective is to secure economical and enduring control of rats as a preventive measure. Where plague or typhus exists, or is suspected in either human or rodent form, more vigorous action is indicated. Under these circumstances emergency measures such as fumigation, trapping, and poisoning should be promptly undertaken and continued as long as laboratory examinations indicate the presence of infection." Bibliography of 14 titles.

Control: Turtles

Anon. A turtle destroyer, Texas Game and Fish (Texas Game, Fish, and Oyster Commission, Austin. 10 cents a copy), 1(8), May 1943, p. 18, 2 photos.

Description and illustrations of an effective and inexpensive turtle trap.

Destruction: Highway mortality

Smith, C. F. Rabbit mortality along an Idaho highway, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 262, 264-265, 1 table.

Records of previous and the present authors tabulated and compared. Variations in mortality appear to parallel fluctuations in populations.

Diseases and Parasites: Aspergillosis

Cowan, I. McT. Aspergillosis in a Thayer gull, Murrelet (Museum Bldg., University of Washington, Seattle 5, Washington. 70 cents a copy), 24(2), May-Aug. 1943, p. 29.

Fraser River estuary, British Columbia, Canada. Description of lesions; causative organism, Aspergillus fumigatus.

Diseases and Parasites: Aspergillosis

Herman, Carlton M., and Gordon Bolander. Fungus disease in a glaucous-winged gull, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 45(4), July-Aug., 1943, pp. 160-161.

Aspergillus fumigatus the apparent cause of death of an individual found in San Francisco, Calif. Reference to an outbreak of this disease among herring gulls at Boston, Mass.

Diseases and Parasites: Encephalomyelitis

Rosenow, Edward. Studies on the relation of a neurotropic Streptococcus and virus to epizootic encephalitis of wild ducks, Cornell Veterinarian (P. P. Levine, Ithaca, N. Y. 75 cents a copy), 33(3), July , 1943, pp. 277-304, 9 figs., 3 tables.

"Two outbreaks of a highly fatal paralytic disease of wild ducks, which had been diagnosed as botulism, were found to be epizootic encephalitis," The localities are given as North Dakota and Minnesota; the number of birds (of a variety of species) killed was 2,000 in 1941 and 1,500 in 1942. The methods and results of the studies are described in detail. The epizootics are thought to have been part of a vast epidemic of equine encephalomyelitis. References to 14 cognate articles.

Diseases and Parasites: Leptospirosis

Larson, Carl L. Leptospirosis in rats (R. norvegicus) in and about Washington, D. C., U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(25), June 18, 1943, pp. 949-955, 4 tables.

Review of previous findings as to the incidence of this disease in rats; in the present survey it was from 30 to 40 percent. Materials, methods, and experimental technic of the investigation are described. Author's conclusions: "Wild rats (R. norvegicus) trapped in and about Washington, D. C., were found to be infected with L. icterohaemorrhagiae. A greater incidence of infection was noted among specimens over 20 cm. in length than among those of smaller size. The most reliable methods for the detection of leptospirosis among rats were serologic examinations of serum and study of Levaditi-stained sections of kidney. It is recommended that the agglutination test be used whenever surveys of the incidence of murine leptospirosis are made." Bibliography of 5 titles.

Diseases and Parasites: Plague

Prince, Frank H. Report on the fleas Opisocrostis bruneri (Baker) and Thrassis bacchi (Roths.) as vectors of plague, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(27), July 2, 1943, pp. 1013-1016, 1 fig. (map).

These fleas infesting Citellus r. richardsoni, C. tridecemlineatus, and C. franklini were experimentally proved capable of transmitting Pasteurella pestis. The map indicates the eastern ranges of the three species of ground squirrels. Bibliography of 6 titles.

Diseases and Parasites: Rodent-borne

Mills, Harlow B. Two human diseases which may be contracted from Montana rodents, Montana State Board of Entomology (Helena) Misc. Publ. 1, 8 pp., 1941.

Plague and tularemia, for both of which, accounts are presented of history and distribution, nature, carriers, transmission to man, and precautions against infection. The relation of animals to the diseases is briefly discussed.

Diseases and Parasites: Spotted fever

Parker, R. R., Glen M. Kohls, and Edward A. Steinhaus. Rocky Mountain spotted fever: Spontaneous infection in the tick Amblyomma americanum, U. S. Public Health Reports (Supt. of Documents, Washington, D.C. 5 cents a copy), 58(19), May 7, 1943, pp. 721-729.

This third species of tick known to transmit spotted fever to man in the United States infests a number of animal hosts, of which rodents, including pocket gophers, are mentioned. Distribution of the tick and characteristics of the disease are discussed. Bibliography of 8 titles.

Diseases and Parasites: Tick-borne

Anon. Beware the tick, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 8(5), May 1943, pp. 9-16, 4 photos, 1 map.

Ticks infect man with such serious diseases as spotted fever and tularemia and may kill game animals by consuming their blood and transmitting paralysis and other maladies to them. The characteristics and distribution of ticks in Wyoming are discussed and suggestions are made as to avoiding tick bite.

Diseases and Parasites: Tularemia

Kohls, Glen M., and Edward A. Steinhaus. Tularemia: Spontaneous occurrence in shrews, U. S. Public Health Reports (Supt. of Documents, Washington, D.C. 5 cents a copy), 58(22), May 28, 1943, p. 842.

Infection demonstrated in Sorex vagrans monticola and in various forms of Microtus.

Diseases and Parasites: Acanthocephala, Acanthocephalus

Hughes, R. Chester, and George A. Moore. Acanthocephalus vancleavei, a new echinorhynchid worm, from a salamander, American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 29(3), May 1943, pp. 724-729, 2 pls.

From Eurycea tynerensis, Oklahoma. Description, measurements, and comparative notes embracing all Acanthocephala known from amphibian hosts. Bibliography of 8 titles.

Diseases and Parasites: Acanthocephala, Polymorphus

Ward, Helen L. A redescription of Polymorphus obtusus Van Cleave, 1918 (Acanthocephala), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(4), Aug. 1943, pp. 289-291, 6 figs.

Description, illustrations. Hosts: water-turkey, great blue heron, ruddy duck.

Diseases and Parasites: Acarina

Radford, Charles D. Genera and species of parasitic mites (Acarina), Parasitology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 37 shillings a copy), 35(1-2), Feb. 1943, pp. 58-81.

Catalog of genera and species, with original references to hosts; a general host list; and 4-1/2 pages of bibliography.

Diseases and Parasites: Acarina, Ornithodoros

Davis, Gordon E. Relapsing fever: The tick Ornithodoros turicata as a spirochetal reservoir, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(22), May 28, 1943, pp. 839-842.

Progeny of ticks collected from a cottontail in Kansas proved infective for relapsing fever through five generations. They may, therefore, be a more efficient reservoir than the mammal host.

Diseases and Parasites: Acarina, Ornithodoros

Davis, Gordon E. American Q fever: experimental transmission by the argasid ticks Ornithodoros moubata and O. hermsi, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(26), June 25, 1943, pp. 984-987.

Both ticks are capable of transmitting the diseases for long periods following the infective feeding. Of the American species, the author says: "O. hermsi is known in six of the western States, viz., California, Oregon, Idaho, Nevada, Colorado, and Washington. Its hosts are chiefly chipmunks (Eutamias spp.), pine squirrels (Tamiasciurus spp.), and man. It is a vector

of relapsing fever in these six States. It comes in contact with man mainly in cabins and mountain homes so constructed as to afford nesting places for rodents. It has also been collected in relatively large numbers from 'snags' and decaying logs."

Diseases and Parasites: Aves, cowbirds

Friedmann, Herbert. Further additions to the list of birds known to be parasitized by cowbirds, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(3), July 1943, pp. 350-356.

The records cited and the bibliographical references to previous summaries give keys to all published information on the subject.

Diseases and Parasites: Blood parasites

Jordan, Helen B. Blood protozoa of birds trapped at Athens, Georgia, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(4), Aug. 1943, pp. 260-263, 1 fig., 2 tables.

Report upon examination of blood smears from 1,115 birds, of which about 1 in 7 showed infections, several of them with 2 and even 3 types of parasites. The incidence of 5 species of Plasmodium, and of protozoans of the genera Haemoproteus and Trypanosoma, is tabulated and discussed. Bibliography of 8 titles.

Diseases and Parasites: Blood parasites

Wood, Sherwin F., and Carlton M. Herman. The occurrence of blood parasites in birds from southwestern United States, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(3), June 1943, pp. 187-196, 1 pl., 2 tables.

Of 1,525 birds representing 112 species and subspecies, 357 of 54 species were infected. Records are tabulated and discussed for the following groups of parasites: Trypanosomes, Haemoproteus, Plasmodium, Leucocytozoon, Heptazoon, intra-leucocytic parasites, and microfilarial worms. No parasites were found in 98 specimens representing 57 species. Mixed infections were disclosed in 52 individuals of 20 species. Spirogregarina fusiformis n.g. et sp. is described and figured from the rock wren, San Nicolas Id., Calif.

Diseases and Parasites: Diptera, Cuterebra

Beamer, R. H., L. R. Penner, and C. W. Hibbard. Some notes on the biology of the pack-rat cuterebrid (Cuterebra beameri Hall) in Kansas, Journ. Kansas Entomological Soc. (University of Kansas, Lawrence), 16(2), April 1943, pp. 47-50, 1 pl.

Notes on the life history of this parasite of Neotoma floridana osagensis. Its eggs are laid at random on objects about the entrance to a pack-rat's nest whence the larvae find their way to the hosts. When full-grown

the larvae seem enormous in relation to the rats, yet up to 5 have been found on a single animal. "The cleanliness of the wounds and of the area about the wounds in the pack rats caused by these huge larvae was remarkable. The warbles never seemed to bother the rats at any time. The only evidence one had that the rats were aware of their parasites was infrequent scratchings of the area with the hind feet. Immediately after a larva had emerged there was quite a large, sometimes bloody, hole in evidence but the rapidity with which these holes closed and completely healed was astonishing. Usually within four or five days practically all signs of the rather terrible wound had disappeared."

Diseases and Parasites: Nematoda, Dipetalonema

Highby, Paul R. Dipetalonema arbuta n. sp. (Nematoda) from the porcupine, Erethizon dorsatum (L.), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(4), Aug. 1943, pp. 239-242, 7 figs.

Original description, measurements, illustrations, comparative notes. Type locality: northern Minnesota. Bibliography of 8 titles.

Diseases and Parasites: Nematoda, Dipetalonema

Highby, Paul R. Mosquito vectors and larval development of Dipetalonema arbuta Highby (Nematoda) from the porcupine Erethizon dorsatum, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(4), Aug. 1943, pp. 243-252, 2 pls.

Characters for distinguishing the larvae of Dipetalonema and Dirofilaria spinosa, both of which infest porcupines in northern Minnesota. Experimentally, six species of mosquitos were shown to be capable of transmitting the first-named parasite. Bibliography of 21 titles.

Diseases and Parasites: Nematoda, Dirofilaria

Highby, Paul R. Vectors, transmission, development, and incidence of Dirofilaria scapiceps (Leidy, 1886) (Nematoda) from the snowshoe hare in Minnesota, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(4), Aug. 1943, pp. 253-259, 1 fig.

Five species of Minnesota mosquitos were demonstrated to be susceptible to the complete larval development of Dirofilaria scapiceps. Infection by this parasite is common throughout the range of the snowshoe hare in Minnesota. Bibliography of 19 titles.

Diseases and Parasites: Nematoda, Filaroides

Dougherty, Ellsworth C. The genus Filaroides van Beneden, 1858, and its relatives: Preliminary note, Proc. Helminthological Soc. Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md.), 10(2), July 1943, pp. 69-74.

Synonymic catalogue of the species of Filaroides and Metathelazia, with names of their type hosts; bibliography of 1-1/2 pages.

Diseases and Parasites: Nematoda, Physaloptera

Morgan, Banner B. The Physaloptera (Nematoda) of rodents, Wasmann Collector (University of San Francisco, Calif. 50 cents a copy), 5(3), April 1943, pp. 99-107, 1 pl.

Key to 5 species (characters illustrated) found in rodents with notes on their history and hosts; comparative measurements; bibliography of 20 titles.

Diseases and Parasites: Protozoa, Eimeria

Hardcastle, A. B. A check list and host-index of the species of the protozoan genus Eimeria, Proc. Helminthological Soc. Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md.), 10(2), July 1943, pp. 35-69.

Species index (hosts mentioned); list of species and specific names not regarded as valid; host index, systematically arranged; bibliography of 10-1/2 pages.

Diseases and Parasites: Protozoa, Hexamita

Stover, Donald E. Hexamita sp. from the ringed-neck pheasant transmissible to turkeys, Journ. Amer. Veterinary Medical Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 103(796), July 1943, p. 37.

An outbreak of hexamitiasis on a game farm in California killed 1,550 out of 2,250 birds of from 2 to 5 weeks of age. The disease was produced in two one-month-old turkey poults by feeding them some of the intestinal contents of infected pheasants.

Diseases and Parasites: Protozoa, Sarcocystis

Herman, Carlton M., and Gordon Bolander. A parasite in the muscles of ducks in California, California Fish and Game (Ferry Bldg., San Francisco, Calif.), 29(3), July 1943, pp. 148-149, Fig. 45.

Description and illustration of cysts of Sarcocystis rileyi in the breast of a pintail duck. Review of recent literature (2 titles) on the subject.

Diseases and Parasites: Siphonaptera

Hubbard, C. Andresen. The fleas of California with check lists of the fleas of Oregon, Washington, British Columbia, Alaska, Idaho, Nevada, and Arizona, Pacific University Bul. (Pacific University, Forest Grove, Oreg.), 39(8), June 1943, 12 pp.

Lists covering 200 species and subspecies with annotations as to distribution and hosts.

Diseases and Parasites: Siphonaptera

Hubbard, C. Andresen. American pocket mouse fleas, Pacific University Bul. (Pacific University, Forest Grove, Oreg.), 39(9), June 1943, 2 pp., figs.

Notes on the distribution and habits of pocket mice and discussion of their fleas of 2 genera and 6 species. One species, Meringis jamesoni, is described (and figured) as new; host Perognathus f. flavus, Colorado.

Diseases and Parasites: Siphonaptera

Jameson, E. W., Jr. Notes on the habits and siphonapterous parasites of the mammals of Welland County, Ontario, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 194-197.

Annotated list of 20 forms, recording the fleas collected from 9 of them.

Diseases and Parasites: Trematoda, Apharyngostrigea

Byrd, Elon E., and James W. Ward. Notes on the genital system of the bird fluke, Apharyngostrigea cornu (Zeder), Journ. Parasitology (Scionco Press, Lancaster, Pa. $1.50 a copy), 29(4), Aug. 1943, pp. 270-274, 3 figs.

Description, illustrations. Hosts: little blue, eastern green, Ward's, and black-crowned night, herons, and the American egret.

Diseases and Parasites: Trematoda, Cyclocoelum

Zeliff, C. Courson. A new species of Cyclocoelum, a trematode from the catbird, Journ. Washington Acad. Sci. (Frank M. Setzler, U. S. National Museum, Washington, D. C. 50 cents a copy), 33(8), Aug. 15, 1943, pp. 255-256, 1 fig.

C. dumetellae n. sp.; description, illustration, comparative notes. Locality, Pennsylvania. Bibliography of 7 titles.

Diseases and Parasites: Trematoda, Heterobilharzia

Price, Emmett W. A redescription of Heterobilharzia americana Price (Trematoda: Schistosomatidae), Proc. Helminthological Soc. Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md.), 10(2), July 1943, pp. 85-86, 1 fig.

Description, measurements, illustrations; hosts: bobcat (Florida) and raccoon (Texas).

Diseases and Parasites: Trematoda, Phyllodistomum

Meserve, F. G. Phyllodistomum coatneyi n. sp., a trematode from the urinary bladder of Ambystoma maculatum (Shaw), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(3), June 1943, pp. 226-228, 1 pl.

Original description, measurements, illustration, comparative notes. Wisconsin. Bibliography of 6 titles.

Diseases and Parasites: Of deer, black-tailed

Cowan, Ian McT. Notes on the life history and morphology of Cephenemyia jellisoni Townsend and Lipoptena depressa Say, two dipterous parasites of the Columbian black-tailed deer (Odocoileus hemionus columbianus (Richardson)), Canadian Journ. Research (National Research Council, Ottawa, Canada. 50 cents a copy), 21(6), June 1943, Section D, pp. 171-187, 9 figs., 1 table.

Life-history and notes and illustrations of the morphology of larval stages of the nose-fly (Cephenemyia), and distribution and life history of the louse-fly (Lipoptena). Bibliography of 7 titles.

Diseases and Parasites: Of muskrat

Dozier, Herbert L. Occurrence of ringworm disease and lumpy jaw in the muskrat in Maryland, Journ. Amer. Veterinary Medical Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 102(795), June 1943, pp. 451-453, 2 figs.

A few cases of ringworm observed, the causative organism not yet identified. In a single animal affected with actinomycosis, the fungus involved was determined as Streptothrix actinomyces. Bibliography of 6 titles.

Diseases and Parasites: Of pheasants

Goble, Frans C., and E. L. Cheatum. Dispharynx spiralis in golden and ring-necked pheasants in New York, Journ. Parasitology (Science Press. Lancaster, Pa. $1.50 a copy), 29(3), June 1943, pp. 230-231.

Records.

Diseases and Parasites: Of quail, valley

Herman, Carlton M., and John E. Chattin. Food habits and intensity of coccidian infection in native valley quail in California, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(3), June 1943, pp. 206-208, 1 fig.

There seems to be a correlation between the consumption of green feed and the intensity of coccidian infection.

Diseases and Parasites: Of robin

Webster, J. Dan. Helminths from the robin, with the description of a new nematode, Porrocaecum brevispiculum, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(3), June 1943, pp. 161-163, 1 fig.

List of 8 worm parasites from robins collected at Ithaca, N. Y., with certain notes on their incidence and geographical distribution. Original description from this material of the species mentioned, illustration, comparative notes. Bibliography of 11 titles.

Diseases and Parasites: Of wildlife

Bell, J. F., and W. S. Chalgren. Some wildlife diseases in the eastern United States, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 270-278, 1 pl., 7 tables.

Summary of results of an investigation by the School of Animal Pathology, University of Pennsylvania. There are brief accounts chiefly of single cases of: pyogenic disease in cottontails apparently induced by ticks, massive subcutaneous infestation of a cottontail by Ixodes dentatus, malignant lymphoblastoma in a cottontail, favus in a crow, and filariasis in a skunk. There is a report on mostly negative results of the examination of 96 cottontails from Missouri. The incidence and pathogenicity of Taenia pisiformis and Sarcocystis in cottontails are discussed. A comprehensive report is made upon the ecto- and endo-parasites recovered from numerous cottontails and a few other animals. These include: ticks, fleas, lice, mites, bot larvae, protozoans, cestodes, and nematodes.

Ecology: Biotic provinces

Dice, Lee R. The biotic provinces of North America, University of Michigan Press (Ann Arbor. $1.75 a copy), viii+78 pp., 1 map. 1943.

This work does not discuss previous definitions of biological regions or of life zones but incorporates usable material in its own discussions of the biotic provinces. These are bounded (also mapped) and described and their most characteristic climatic features, plants, and animals recorded. Thorough examination of the literature is indicated by the 9-1/2 page bibliography. Twenty-nine provinces are defined for America north of central Mexico. Zonation is not predominant except in the North. The author refers to his work as experimental.

Ecology: Census methods, pellet counts

Arnold, Joseph F., and Hudson G. Reynolds. Droppings of Arizona and antelope jack rabbits and the "pellet census", Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 322-327, 1 fig., 2 tables.

Authors' summary: "(1) Arizona and antelope jack rabbits fed in captivity on different types of food show certain characteristic depositions of fecal material; (2) the age and weight of mature animals do not affect the number or weight of pellets voided by either species of jack rabbit; (3) pellet count remains constant, on the average, irrespective of age, sex, size, or species of rabbit. A jack rabbit of either species voids an average of 531 ± 27 pellets per day when eating green, native forage material; (4) pellet weight and weight of food consumed show a direct linear relationship. When eating green native forage the animals of either species void about 55 per cent of the weight of ration ingested; (5) character of forage consumed has a greater effect upon pellet weights than upon pellet counts; (6) some uses of pellet weights and counts are outlined. The use of pellet weights to determine forage removal is suggested." Bibliography of 11 titles.

Ecology: Censuses, mammal

Mohr, Carl O. A comparison of North American small-mammal censuses, American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 29(3), May 1943, pp. 545-587, 1 fig.

Reduction to a common denominator of weight of the population in grams per acre permits comparisons of census results. These are made and discussed for numerous species by the following groups: Carnivorous, omnivorous, and insectivorous species, and phytophagous species. Abundance of food largely determines the number of animals but "Within each food class populations are a function of size." Bibliography of 4 pages.

Ecology: Cut-over woodland

Lay, Daniel W., and Walter P. Taylor. Wildlife aspects of cutover pine woodland in eastern Texas, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 41(6), June 1943, pp. 446-448, 1 fig.

Shows in text and graph the order of succession and the varying abundance of the principal plants and animals over a period of 45 years.

Ecology: Florida Ship Canal

Wright, Albert H. The Atlantic-Gulf or Florida Ship Canal (The Author, Ithaca, N. Y. 75 cents a copy), 42 pp. 1943.

Arguments pro and con by politicians, engineers, and biologists. Some of the last class, in answer to a questionary, comment on probable effects of construction of the canal upon the flora and fauna.

Ecology: Overpopulations, deer

Leopold, Aldo. Deer irruptions, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 8(3), Aug. 1943, pp. 3-11, 12 graphs.

Review of illustrative instances in Michigan, Pennsylvania, and Arizona, the courses of which are recounted and graphed. The effects of deer irruptions are most noticeable upon, and through, winter food supply; are localized and exaggerated by the comparatively sedentary nature of deer; and are made worse by artificial feeding before herd reduction. Predisposing factors include: removal of predators; logging, providing abnormal quantities of slash and shrub feed; and buck laws. "The killing of males in a polygamous species has, within ordinary limits, no effect on reproductive rate." The stages of irruption are described and the point made that prompt herd reduction makes possible maintenance of numbers at a higher level than if the phenomenon is allowed to run its course, as the environment then will be so depleted as to have carrying capacity for only a minimum population. Bibliography of 27 titles.

Comment: The author states, "We have found no record of deer irruption in North America antedating the removal of deer predators." The reviewer has often wondered about this point and as to whether removal of predators could result in serious overpopulations. He could only doubt as his studies of food habits led him to believe "that the importance of predators in controlling animal populations has always been over-rated" (Nature, 130, p. 961, 1932). Dymond's conclusion should not be forgotten that, "it is the prey . . . which determine the numbers of their predators" (Rod & Gun in Canada, 40, p. 27, 1939), nor Preble's finding that a devastating irruption of the snowshoe hare occurred where there had been no special interference with its predators (N. A. Fauna, 27, 1908, p. 199). Leopold concludes with reference to deer predators, "that their removal does not cause irruptions but paves the way for irruptive behavior, either at once, or at some future time."

Ecology: Pheasant

Dalke, Paul D. Effect of winter weather on the feeding habits of pheasants in southern Michigan, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 343-344.

During periods of deep snow, pheasant activities are restricted but some feeding occurs. Sleet storms limit the kinds of food available to these birds but they have been known to peck through nearly an inch of ice to corn on the cob. Crupes and other fruits growing on vines along fences furnish a supply of food at such periods. Temperature does not appear to affect the normal feeding behavior of pheasants, although they do seek protection from both cold and strong winds. Rainstorms do not keep pheasants under cover unless the showers are very heavy.

Ecology: Populations, ground squirrel

Evans, F. C., and R. Holdenried. A population study of the Beechey ground squirrel in central California, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 231-260, 2 pls., 6 figs., tables.

Report on 5 years of investigation, during which 1,154 squirrels were caught and 949 of them were marked and released. The environment is described and the food plants listed and ranked in importance. Details are given of the methods employed; marking was with dyes. Life history is succinctly but comprehensively treated and factors in the regulation of numbers of the animals (including predators) are considered. Population densities and fluctuations, sex and age ratios, longevity, home range, movements, social behavior, and territorialism are thoroughly discussed. Bibliography of 20 titles. A first-class contribution.

Ecology: Populations, rodent

Gray, John A., Jr. Rodent populations in the sagebrush desert of the Yakima Valley, Washington, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 191-193, 2 tables.

Description of the area and lists of the principal plants and mammals. Results with live and killer traps are compared. Active rodent population during August and September 1941 was estimated at 44 individuals per acre (32 of which were Perognathus parvus).

Ecology: Territory

Burt, Wm. H. Territoriality and home range concepts as applied to mammals, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(3), Aug. 1943, pp. 346-352, 1 fig.

Probably all animals have territories; their maintenance among mammals is discussed; home range is given a restricted definition. "Home range then is the area, usually around a home site, over which the animal normally travels in search of food. Territory is the protected part of the home range, be it the entire home range or only the nest. Every kind of mammal may be said to have a home range, stationary or shifting. Only those that protect some part of the home range, by fighting or aggressive gestures, from others of their kind, during some phase of their lives, may be said to have territories." Bibliography of 21 titles.

Economics: Muskrat, Ohio

Gilfillan, Merrill C. Ohio muskrats--value, importance, Ohio Conservation Bulletin (Division of Conservation, State Office Bldg., Columbus, Ohio. 10 cents a copy), 7(8), Aug. 1943, pp. 4-5, illus.

In excess of 700,000 pelts taken annually which make up more than 70 percent of all furs harvested in the State, and bring an income that averages $10 each for about 150,000 trappers. Productive muskrat habitats are described. Ponds, marshes, and swamps averaged 6 muskrats per acre (value $9.60), and stream and ditch banks 27.5 animals per mile or 2.3 per acre (value $3.67 per acre).

Economics: Value of birds

Magie, Henry. Our needs for song birds this wartime, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh, N. C.), 7(7), July 1943, pp. 8-11, 1 photo.

Specific examples of insect destruction by birds; notes on martins and gourd nests for them; esthetic value of birds; cats as enemies of birds.

Education: Biology

Smith, Ella T. Exploring biology. Revised Edition. Harcourt, Brace, & Co. (383 Madison Ave., New York, N. Y. $2.24 a copy, usual school discounts), xxii+619 pp., 394 figs. + vignettes.

A carefully prepared and attractive text book, accompanied by tests and a teacher's key. The section of most interest to readers of WILDLIFE REVIEW doubtless is that entitled, "Our welfare is tied up with that of other living things." Four and a half pages are devoted to suggestions for a classroom library.

Food Habits: Birds vs. false chinch bug

Knowlton, George F., and Stephen L. Wood. Utah bird predators of the false chinch bug, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 36(2), April 1943, pp. 332-333, 1 table.

This widespread insect (Nysius ericae) sometimes becomes destructive to sugar beets, alfalfa, clover, and other forage and garden crops in Utah. Of some 2,500 bird stomachs examined from 1934 to 1942, 420 representing 46 species contained remains of these bugs. Further details are given in table and text.

Food Habits: Enemies of birds

Tavernor, P. A. Do fishes prey upon sea-birds?, Ibis (Dr. G. Carmichael Low, 7 Kent House, Kensington Court, London, W. 8, England. 12 shillings, 6 pence a copy), 85, July 1943, p. 347.

Killer whales mouthing an injured brant; pike preying upon young ducks and grebes; cod taking paroquet auklet, Brunnich's murre, and cormorants; bullfrog preying upon Baltimore oriole and olive-sided flycatcher; snapping turtle reputed to be an enemy of birds, especially wounded individuals.

Food Habits: Mice vs. grasshopper eggs

Telford, Horace S. White-footed mice feeding upon grasshopper eggs, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(3), Aug. 1943, pp. 400-401.

Peromyscus maniculatus osgoodi upon eggs of Melanoplus differentialis; North Dakota.

Food Habits: Mice vs. pine seeds

Moore, A. W. The pocket gopher in relation to yellow pine reproduction, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 271-272, 1 table.

Ochocho National Forest, Oregon. On areas grazed by cattle and infested by pocket gophers, pine reproduction is prevented. The gophers do not appear to take pine seeds but white-footed mice traveling in their burrows probably consume the crop.

Food Habits: Natural control of spruce sawfly

Conklin, James G. An analysis of the biological control of the European spruce sawfly in New Hampshire, with particular reference to predators, Ohio State University (Columbus) Abstracts of Doctoral Dissert. 37, 1941 (1942), pp. 63-73, 4 tables.

This species (Gilpinia polytoma) is generally considered to be one of the most destructive insects affecting the spruce forests of northeastern North America. Artificial control is impracticable, hence natural enemies are of prime importance. The larvae are attacked to some extent by birds, especially by warblers. A considerable proportion of the cocoons are destroyed by small mammals, including shrews and mice and other rodents. Disease, however, is the principal mortality factor.

Food Habits: Pellet analysis

Glading, Ben, Daniel F. Tillotson, and David M. Selleck. Raptor pellets as indicators of food habits, California Fish and Game (Ferry Bldg., San Francisco, Calif.), 29(3), July 1943, pp. 92-121, Fig. 30, 15 tables.

Experiments with captive birds of 8 species (5 hawks, 3 owls) in which certain foods were given and the resulting pellets analyzed by investigators ignorant of the original feedings. The results are tabulated and discussed. Lack of correspondence between pellet items and meals seems to have impressed the authors but they were less evident with the owls for which pellet analysis as a means of food habit study has been most used. Probably no one has ever claimed that pellet analyses yield evidence of all foods taken but the evidence they provide is good so far as it goes. Miscounting prey individuals in pellet material is a matter of technic that can largely be corrected by diligent attention to detail. This paper is hypercritical in giving weight to weaknesses of the method of pellet analysis which are well known and so far as possible guarded against by experienced workers. No one regards the method as "fool proof," so there is considerable windmilling here. Certain of the arguments were discussed in a paper published in the Condor in 1930 (Vol. 32, pp. 15-19). This is not mentioned in the Literature Cited (5 titles) though it was in reply to the first article named in that list.

Food Habits: Rodents vs. spruce sawfly

Martineau, R. Population studies of the European spruce sawfly (Gilpinia hercyniae Htg.), Forestry Chronicle (10 Manor Road, West, Toronto, Canada), 19(2), June 1943, pp. 87-107, 2 figs., 8 tables.

In this paper on a seriously destructive insect, the activities of mammals are discussed (pp. 95-96, Table 3), their influence set forth (pp. 99-101, Table 8), and the following summary presented: "Mice, shrews and squirrels constitute very important natural agencies in the control of the spruce sawfly. In our studies 60.4 per cent of the 645,580 cocoons found within the limits of the plots were chewed by these predators. To date the parasites have been a much less important control factor than the rodents." Bibliography of 12 titles. See also abstracts, Natural History: Small mammals of New Brunswick, p. 42; and Food Habits: Natural control of spruce sawfly, p. 18.

Food Habits: Utilization of aquatic plants

Bellrose, Frank C., and Harry G. Anderson. Preferential ratings of duck food plants, Illinois Natural History Survey (Urbana) Bul. 22(5), May 1943, pp. 417-433, frontis. + 16 figs., 6 tables.

By dividing the percentage of use (based on volumetric analyses of the contents of 3,200 duck gizzards) by the percentage of abundance (based on acreages occupied in the lakes studied), the authors get figures for index values, which show that rice cutgrass, wild millets, smartweeds, and nutgrasses are the outstanding waterfowl food plants in the Illinois River Valley. Twenty-five groups of plants are discussed in the order of their rating and the majority of them are illustrated. Bibliography of 7 titles. Good work.

Food Habits: Of coyote

Lehmann, V. W., and W. G. Fuller. Don Coyote, arch enemy of nesting bobwhites, Texas Game And Fish (Texas Game, Fish, and Oyster Commission, Austin. 10 cents a copy), 1(9), Aug. 1943, pp. 9, 15, 3 figs.

On an area where stringent predator control had been carried on the previous winter, coyotes, nevertheless, were highly destructive of bobwhites, especially in the egg stage. Stomach analyses confirmed the results of field studies of the losses. Only about 5 nests in a hundred were successful in the early part of the season, but a larger proportion were productive in a later egg-laying period stimulated by heavy rains. In the fall, however, there were only 2.2 young birds to each adult; a normal proportion would have been 5:1. Additional coyote control would improve the bobwhite crop. The predators were also eating young Hereford calves. Fire ants were responsible for the destruction of about 1 percent of the quail eggs.

Food Habits: Of deer, white-tailed

Bramble, W. C., and M. K. Goddard. Seasonal browsing of woody plants by white-tailed deer in the bear oak forest type, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 41(7), July 1943, pp. 471-475, 1 fig., 2 tables.

The bear oak (Quercus ilicifolia) occupies 2 million acres in Pennsylvania; the studies reported upon were made in the Barrens of the central part of the State where the deer population is one head to about 20 acres. Authors' summary: "Although white-tailed deer browsed all of the common woody plants in the bear oak forest type at one time or another during the year, they exhibited definite seasonal preferences that were correlated not only with differences in availability of the various species but also with seasonal differences in feeding habits and preferences. Of all the species browsed, sweetfern and prairie willow were utilized most heavily in the critical seasons of winter and spring; Jersey-tea, hawthorn, and Allegheny plum . . . in the summer; and Jersey-tea and sweetfern . . . in the fall. Other species which were utilized heavily in the winter when other foods were scarce or unavailable were trembling aspen, dwarf gray willow, chokeberry and bear oak. Service berry and dwarf chinquapin oak were moderately utilized during the winter. In a program of game management on areas occupied by the bear oak type, management practices should encourage those woody species which are consistently used as a winter food by deer." Bibliography of 7 titles.

Food Habits: Of flicker

Knowlton, G. F., and G. S. Stains. Flickers eat injurious insects, Canadian Entomologist (Entomological Society of Ontario, Guelph, Canada), 75(6), June 1943, p. 118.

Report on 16 stomach contents giving the scientific names of the insects and other food items identified. In one stomach there were 3,747 adults, in addition to 1,416 of the immature stages of ants.

Food Habits: Of foxes

Kozicky, Edward L. Food habits of foxes in wild turkey territory, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 14(4), July 1943, pp. 8-9, 28, 3 photos, 4 tables.

Report on analyses of 193 scats, an estimated 80 percent of which are considered those of gray foxes. No evidence of predation upon wild turkeys was found. Walking-sticks, grasshoppers, white-footed mice, and huckleberries were the principal fall foods. Previous reports on fox foods are briefly abstracted. Bibliography of 9 titles.

Food Habits: Of owl, great gray

Tryon, C. A. The great gray owl as a predator on pocket gophers, Wilson Bulletin (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 55(2), June 1943, pp. 130-131.

Field observation in Montana.

Food Habits: Of owl, great horned

Mack, H. G. Every game breeder knows Bubo, the great horned owl, Modern Game Breeding (Doylestown, Pa. 25 cents a copy), 13(7), July 1943, pp. 4-5, 2 photos.

Of large birds lost to this predator, the author lists "a very large tame turkey gobbler, a large African gander, a full grown peacock, and Canada geese." The article is refreshingly different from the average comment upon "vermin" in acknowledging the owl's admirable qualities and its place in nature. "He knows no fear and when trapped awaits his fate without futile struggle or vain imprecation. He dies as he lives, the peerless predator, who, perhaps, in the aggregate, does a hundred times more good for man in keeping check on the fertile legions of rodents, than the value of the useful lives he takes."

Food Habits: Of owl, short-eared

Terres, John K., and E. W. Jameson, Jr. Plague of mice as food for short-eared owls, Wilson Bulletin (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 55(2), June 1943, p. 131.

Microtus pennsylvanicus unusually abundant in central New York in 1941-42. In 142 short-eared owl pellets, remains of 150 mice were identified of which 124 were of the field vole.

Food Habits: Of raptors

Solleck, David M., and Ben Glading. Food habits of nesting barn owls and marsh hawks at Dunc Lakes, California, as determined by the "cage nest" method, California Fish and Game (Ferry Bldg., San Francisco, Calif.), 29(3), July 1943, pp. 122-131, Figs. 31-32, 4 tables.

At fledging time the young birds were confined in wire netting pens and account was kept of food items brought to them by the adult birds. The results are tabulated for 6 broods of barn owls and 3 of marsh hawks. On a frequency basis, mammals made up 92 percent of the diet of the former, and only 18 percent of that of the latter, species. "Barn owls on this area of high valley quail concentration did not take appreciable numbers of quail or other birds. Marsh hawks, on the other hand, took a relatively high percentage of quail, as much as 23.5 per cent of all items in the case of one nest."

Food Habits: Of toad

Larson, N. P. The common toad as an enemy of blister beetles, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 36(3), July 1943, p. 480.

In South Dakota gardens infested with blister beetles, one adult, and 65 of 100 young, toads were found by stomach analysis to have eaten the supposedly "protected" blister beetles. A table of chiefly family identifications of other insects found in the stomachs is given.

Food Habits: Of turtle, snapping

Alexander, Maurice M. Food habits of the snapping turtle in Connecticut, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 278-282, 1 fig., 1 table.

Author's summary: "In the summers of 1939 to 1941 a total of 470 stomachs were collected from snapping turtles taken in Connecticut from lakes, ponds, streams, and swamps to determine where these turtles might be destructive to other wildlife. Aquatic plants and fish are of about equal importance as food taken and crayfish rank third. The fish taken are mainly suckers, bullheads, sunfish, and perch. The faster and better game fish are not taken by the snappers in any appreciable amount. Of the four habitat types studied in Connecticut, the snapper is of greatest importance as a predator in the lakes and of least importance in the swamps. It may or may not be important in ponds and streams. The economic importance of this turtle depends largely upon the habitat in which it lives, because there is a high correlation between the availability of various food items and the amounts of each taken. Before any individual habitat can be designated as a place where turtles can become important, it is necessary to have some knowledge of the plants and animals present. Plant communities seem to be required for the presence of snapping turtles and tend to determine their relative abundance."

Life Histories: Bear, black

Stevens, Clark L. The black bear in New Hampshire, Granite State Forester (Forestry Club, University of New Hampshire, Durham), No. 5, 1943, pp. 57-66, 1 pl., 14 tables (mimeographed).

Compiled information as to distribution, color, size, weight, habitat, cruising radius, food, breeding habits, populations, and status as a game animal throughout the United States. The author considers bears in relation to sheep in New Hampshire, the number of animals in the State (about 800), which is below normal, and seasonal food as determined by analyses of droppings (wild berries and acorns most important in summer; acorns, beech nuts, apples, and grapes in fall). Suggestions for management are made; the species receives no protection now but should be placed on the game list and its numbers controlled by manipulation of open seasons. Bibliography of 28 titles.

Life Histories: Beaver

Hammond, Merrill C. Beaver on the Lower Souris Refuge, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 316-321, 1 pl., 5 tables.

Author's summary: "(1) Surplus beavers were trapped from the Lower Souris National Wildlife Refuge in February, March, and April, 1942; (2) winter food consisted principally of red osier dogwood (Cornus stolonifera), green ash (Fraxinus pennsylvanica), and willow (Salix interior); (3) trapping in bank feeding dens met with marked success; (4) weights and measurements indicated three age groups in which beavers could generally be placed, 1st year, 2nd year, and adults; (5) the sex ratio among young ran slightly to males, that of adults showed a preponderance of females; (6) colony composition was of four types: (a) A pair of adults; (b) a pair of adults and 1st year young; (c) adults and both 1st and 2nd year young (most common); and (d) colonies of more than 2 adults and young of 1 or 2 years, or both. No 'bachelor' houses or dens were found; (7) quantity of stored food was found to give

a rough indication of colony size. Those with large storage piles (over 1,200 square feet) were believed to contain an average of 9, colonies with 750 to 1,200 square feet an average of 7.1, and colonies with small piles (under 750 square feet) an average of 3.7 beavers; (8) eighteen of the 118 beavers were pregnant females; they contained 76 embryos, an average of 4.2 per female; (9) the potential population increase, on the basis of pregnancy, indicated an exceedingly high mortality of either embryos, immatures, or matures has been occurring."

Life Histories: Beaver

Moore, George C. Alabama's busy beaver, Alabama Conservation (Alabama Dept. of Conservation, Montgomery. 5 cents a copy), 15(2), Aug. 1943, pp. 8-9, 12, 9 photos.

Never extirpated from the State, the beaver under protection, and aided by transplanting, has increased until in 1941 its numbers were about 3,500. The article defines the distribution of the animal in the State and briefly comments upon its life history and value.

Life Histories: Cottontail

Dalke, Paul D., et al. The cottontail rabbits in Connecticut. A report on the work of the Connecticut Wildlife Research Unit, Paul D. Dalke, Leader, 1935-38. Edited by N. W. Hosley. Conn. Public Document 47 (James Brewster, State Librarian, Hartford), 93 pp., 22 figs., 43 tables, 1942 (1943).

It is gratifying that this report on a thorough study of the cottontail is at last available (though long delayed). Contributors are: Paul D. Dalke, Charles E. Friley, Jr., Palmer Sime, George Spinner, Erwin Jungherr, Carl F. Clancy, Kenneth E. Hungerford, and N. W. Hosley, the last named editing the whole. It is impracticable to note the findings here in any detail. The scope only of the work can be indicated by citing the section headings: Identification of Connecticut cottontails, cover preferences, home and seasonal ranges, food habits, breeding cycle, breeding habits, molting, internal parasites, and management. Three-page bibliography. An excellent work.

Life Histories: Duck, Wood

Ayars, James S. Woodies are queer ducks, Saturday Evening Post (Curtis Publishing Co., Philadelphia, Pa. 10 cents a copy), 216(5), July 31, 1943, pp. 26-27, 80, 82, 6 col. photos.

Description, distribution, increase under protection. Invasion of unusual habitat possessing acceptable nesting sites. Account of observations in Illinois of the young jumping from the nest opening and fluttering to the ground. This has been the sole method noted in more than 40 instances. Increasing the birds by providing nest boxes has been very successful. The findings of Hawkins and Bellrose as to life history of the bird are recounted. Natural enemies take a great toll of wood ducks but one of them, the raccoon, can be excluded from the nest boxes by a diamond-shaped entrance four inches

wide and three inches high. (Designed by Bellrose.) Legal protection of the species is discussed and in view of recent authorization to include one of these ducks in a hunter's bag, instructions for recognizing the species are given.

Life Histories: Goose, Blue

Soper, J. Dewey. Life history of the blue goose (Chen caerulescens (Linnaeus), Proc. Boston Soc. Nat. Hist. (Boston, Mass.), 42(2), pp. 125-222, Pls. 15-26. 1943.

This author has previously published more than any other on the blue goose, the nesting place of which he first discovered. The present paper summarizes his earlier findings and collects and digests the contributions of others. Special attention is given to distribution, migrations, and numbers. The latter are large, possibly in the order of five millions. An excellent summary of information on the bird.

Life Histories: Goose, Canada

Williams, Cecil S., and Marcus C. Nolson. Canada goose nests and eggs, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(3), July 1943, pp. 341-345, 2 tables.

Characteristics of nesting sites and nests; and measurements of 105 nests and 174 eggs.

Life Histories: Gull, California

Beck, D. Elden. Life history notes on the California gull, No. 1, Great Basin Naturalist (Brigham Young University, Provo, Utah. 50 cents a copy), 3(3-4), Dec. 1942, pp. 91-108, 4 pls.

Report upon observations made on Rock Island in Utah Lake, the plant communities of which are described. In 1942 the nesting birds were estimated at 27,850 and the maximum population, including young, at 68,744. The life history topics discussed are: Arrival and prenesting activities, nest construction, mating, eggs and their incubation, hatching and care of young, plumage changes, and migration.

Life Histories: Mouse, Sage

Moore, A.W. Notes on the sage mouse in eastern Oregon, Journ. Mammalogy (Ernst T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 188-191, 1 table.

Lemmiscus pauperrimus. Habitat, sex ratio (1:3), size of litters (4-10), habits, population fluctuation, food (grasses). Bibliography of 6 titles.

Life Histories: Muskrat

Bellrose, Frank C., Jr., and Jessop B. Low. The influence of flood and low water levels on the survival of muskrats, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 173-188, 2 pls., 1 fig., 3 tables.

Report on studies made at three of the Illinois River lakes--Douglas, Rice, and Chautauqua--with normally fluctuating, semistable, and stable water levels, respectively. The reactions of the muskrats to rising and falling waters, including feeding activities, are described. The disturbances increased intraspecific fighting that often resulted in mortality. Predators also seized the opportunity for increasing their take. Suggestions are made as to how the muskrats may be aided in emergencies.

Life Histories: Muskrat

Sanderson, Wilford E. The muskrat, School Nature League Bul. (National Audubon Society, 1006 Fifth Ave., New York, N. Y.), 13(2), Oct. 1942, 4 pp., 3 photos, 1 line cut.

Popular account of the distribution, characteristics, life history, and economic value.

Life Histories: Phainopepla

Crouch, James E. Distribution and habitat relationships of the phainopepla, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(3), July 1943, pp. 319-333, Pls. 8-10.

Geographical and zonal distribution; important plants in the habitat (the most significant, mistletoe, the berries of which are a staple food), bird associates (one the dwarf cowbird, a parasite), migration; two-page bibliography.

Life Histories: Phainopepla

Rand, A. L., and R. M. Rand. Breeding notes on the phainopepla, Auk (J. Fletcher Street, 1120 Locust Street, Philadelphia, Pa. $1.00 a copy), 60(3), July 1943, pp. 333-341.

The male does most of the nest building and begins nests prior to acquisition of a mate. Song is of minor consequence but territoriality is nevertheless well in evidence. Details of nesting and rearing are given. Together this and the article noted in the preceding abstract constitute a good contribution toward a life history of the phainopepla. Such studies are characteristic of present-day ornithology; a generation ago there were almost none of them.

Life Histories: Pika

Martin, Ken. The Colorado pika, Journ. Mammalogy (Emmet T. Hooper) University of Michigan, Ann Arbor. $1.00 a copy), 24(3), Aug. 1943, pp. 394-396, 1 table.

Ochotona princeps saxatilis. The table shows weights, measurements, and incidence of parasites (tapeworms, fleas, caecal worms, and stomach worms) and sex of 7 specimens. There are notes on food and feeding (including storing) habits.

Life Histories: Prairie chicken

Yeatter, Ralph E. The prairie chicken in Illinois, Illinois Natural History Survey (Urbana) Bul. 22(4), May 1943, pp. 377-416, frontis. + 18 figs., 2 tables.

Another valuable life history study by Yeatter accompanied by management recommendations. The original, and the present greatly restricted, ranges of the prairie chicken in Illinois are discussed and the latter mapped and correlated with farming areas and practices. The section on life history summarizes the findings of other recent students as well as those of the author, on the: Sexual cycle, booming, flocking, movements, cover requirements, nesting habits, nest losses, and weights. Population studies, mortality, and food habits are treated in the same thorough way. Management is discussed under the heads of: legal protection, refuges, farming practices, predator control, and restocking. There is a paragraph in the summary for each important division of the text and a list of 40 titles of literature cited.

Life Histories: Rat, Wood

Richardson, William B. Wood rats (Neotoma albigula): Their growth and development, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 130-143, 2 pls., 3 figs., 2 tables.

Account of observations on mothers and young in captivity; gestation period 38 days or more; number in litter usually two. The development and habits of the young are described. Arizona. Bibliography of 6 titles.

Life Histories: Skink, Black-banded

Breckenridge, W. J. The life history of the black-banded skink Eumeces septentrionalis septentrionalis (Baird), American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 29(3), May 1943, pp. 591-606, 7 figs., tables.

Description, measurements, and statements of range and habitat are given and the life history is discussed under the heads of: Hibernation, breeding habits, egg-laying and nesting, incubation period, growth rate, food, and enemies. The paper is carefully summarized and includes a tabulation of the food items identified from 37 stomachs. Bibliography of 12 titles.

Life Histories: Squirrel, Flying

Sollberger, Dwight E. Notes on the breeding habits of the eastern flying squirrel (Glaucomys volans volans), Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 163-173, 1 pl., 5 tables.

Review of previous writings on the subject (8 cited) and account of the author's observations in New York, Pennsylvania, and Ohio. There appear to be two litters produced each year. The phenomena of reproduction are discussed and the young, at all stages of growth, are described; measurements and illustrations are presented. Other sections of the paper are devoted to care of young, nesting sites, numbers per unit area, degree of sociability, and longevity. Cages and care in captivity are described.

Life Histories: Squirrel, Pine

Hatt, Robert T. The pine squirrel in Colorado, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(3), Aug. 1943, pp. 311-345, 12 pls., 5 figs.

A distinctive study planned with a view to obtaining results comparable with those of an earlier investigation of the eastern red squirrel. The relationships (systematic and ecologic) and physical characteristics of the pine squirrel (Tamiasciurus f. fremonti) are discussed and life history topics treated under the following heads: Indications of its presence, the expressive chickaree, methods of locomotion, the day's cycle, vertical range, favored forests, relation to fires, spacing, nest groupings, restriction to outside nests, limited diet, gnawing of bones, barking of trees, middens, feeding, the harvest and its storage, reproduction, behavior near brood nest, lack of competition, parasites and associates, and social status. Bibliography of 12 titles.

Life Histories: Swallow, Violet-green

Edson, J. M. A study of the violet-green swallow, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(3), July 1943, pp. 396-403, 1 table.

Summary of studies in Washington State "for many years" as to migration, nesting, incubation, development of young (weights given), enemies, parasites, and climatic disasters.

Life Histories: Thrush, Wood

Brackbill, Hervey. A nesting study of the wood thrush, Wilson Bulletin (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 55(2), June 1943, pp. 73-87, 1 pl.

Observations on one pair in Maryland, summarized as to: Nests, incubation, brooding, feeding, nest sanitation, development of young, territory, and voice. Bibliography of 8 titles.

Life Histories: Turkey

Leopold, A. Starker. The molts of young wild and domestic turkeys, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 45(4), July-Aug. 1943, pp. 133-145, Figs. 55-58, 2 tables.

Description of the molts and illustration of the plumages; graph of replacement of the principal wing and tail feathers; discussion of the causes of variations in molt. Young turkeys undergo three molts before acquiring a stable winter plumage. Adults have two molts a year, namely, a complete annual molt in summer and fall, and a partial prenuptial molt in late winter. "The existence of distinctive characters in the molting habits of M.[eleagris] g.[allopavo] silvestris and the domestic turkey, and the intermediate expression of these differences in the hybrids, may have some practical use in helping to recognize the true relationships of birds of questionable origin. Particularly on game farms, where the purest possible strains of the Eastern Wild Turkey are being sought, recognition of the typical molts of silvestris may be helpful in selective breeding. It is not inconceivable that the molting habits of an individual turkey may be more closely associated with the physiological condition known as 'wildness,' than plumage color or general external appearance." Bibliography of 15 titles.

Life Histories: Upland game birds

Knott, Norman P., Chester C. Ball, and Charles F. Yocom. Nesting of the Hungarian partridge and ring-necked pheasant in Whitman County, Washington, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 283-291, 1 fig., tables.

From authors' summary: Nesting studies were conducted during the years 1940-42. Nests were best found by following farm machinery and searching bunchgrass and brushy areas by parting the vegetation; questionnaires proved partly successful. Hungarian partridges begin pairing during early February; clutches averaged 16.7 (10 to 25) eggs; extremely large clutches may include eggs from more than one hen; of 113 nests, 7 contained pheasant eggs; partridges are not known to lay in nests of other game birds. The peak of hatching is generally in the first or second week of June; the nests averaged 750 and 290 feet, respectively, from permanent cover and water. About half (46%) of the nests were in alfalfa, and a third (33.8%) in permanent cover. hay fields comprise only 33 percent of the Whitman County land in farms and permanent cover from 12 to 32 percent; grain fields are little used because nests are poorly concealed during building. Of the observed nests, 57.5 percent were successful; nearly all losses were caused by farming activities--plowing destroyed over 15 percent and mowing 37 percent. Hungarian partridges often attempt a second nesting if the first clutch is destroyed; about 70 percent of the adult females eventually raise a brood. Ring-necked pheasant cocks establish crowing areas and gather harems of one to seven hens by about April 1; the 76 completed nests observed averaged 13.6 (6-25) eggs each; incubation lasts 23 to 24 days; in 1940 the climax of hatching was in the first week of June. Of 147 pheasant nests, those not in permanent cover averaged 325 feet out from such cover, and all nests averaged 693 feet from water; 31.9 percent of the observed nests were in permanent cover. Mowing, plowing, disking, and burning accounted for 67 percent of the nests destroyed; 48.3 percent of all observed nests were unsuccessful. Nearly 58 percent of the nests in temporary cover were in alfalfa and wheat stubble; the latter was used more by pheasants than by partridges. The earlier hatching peak for pheasants, as compared with

partridges, accounted for a higher percent of success in hay-field nests, since most pheasant nests hatched before the hay was cut; the greatest loss of pheasant nests in temporary cover was in stubble where the nests are either plowed under or burned before hatching. Overgrazing makes more than half of the available permanent cover unsuitable for nesting. Official action is being taken to reduce losses.

Life Histories: Warbler, Yellow

Schrantz, F. G. Nest life of the eastern yellow warbler, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(3), July 1943, pp. 367-387, 3 tables.

Account of observations in Iowa on 41 nests under the heads of nest building, egg laying, incubation, and growth of young. Weights and measurements of eggs, weights of young, and survival of young are recorded in text, tables, or graphs. Bibliography of 11 titles.

Life Histories: Weasel

Glover, Fred A. A study of the winter activities of the New York weasel, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 14(6), Sept. 1943, pp. 8-9, 2 photos.

Mustela n. noveboracensis. Males are larger and sex can be told from a clear tarsal imprint. The sex ratio is about 1:1. Males travel more than females and have a longer cruising radius. Information is given on preferred habitat, dens, and population density. This was one individual to 38.2 acres in open forest, 26.4 acres in cuttings and slash, and 6.5 acres in dense sprout-growth. Food, cover, and weather were the main factors affecting weasel activity.

Life Histories: Woodcock

Pitelka, Frank A. Territoriality, display, and certain ecological relations of the American woodcock, Wilson Bulletin (Josselyn Van Tyne, University of Michigan, Ann Arbor, Mich. 50 cents a copy), 55(2), June 1943, pp. 88-114, 10 figs., 6 tables.

Report on the study of 3 males in Illinois with special reference to territorialism, call notes, strutting, and mating. Bibliography of 25 titles. A thorough study by modern methods.

Management: Bobwhite

Sanders, Earl. Development of a bob-white management area in southern Iowa, Iowa Agr. Expt. Sta. (Ames), Research Bul. 317, pp. 699-726, 2 figs., 13 pls., May 1943.

The management area is described, especially with respect to bobwhite food and cover conditions, and the relation of land use to the birds. Certain

materials were donated to the farmers and some fees were paid but practices in these respects varied during the term of the study and on the whole they were not very effective. Bobwhite populations, their fluctuations, and mortality factors, breeding potential and productivity are discussed. The management project was organized to improve unsatisfactory farmer-sportsman relationships but did not have that effect. Farmers did not want urban hunters on their lands even at a fee of $10 per day apiece. The hunting that was done was by farmers and their friends. "Most of these farmers desired quail on their farms for aesthetic reasons. They frequently said they liked to see them about and to hear their calls." Bibliography of 9 titles.

Management: Burning

Bickford, C. A. The use of fire in the protection of longleaf and slash pine forests, Southern Forest Experiment Station (New Orleans, La.), Occasional Paper 105, 32 pp., 3 figs., 1 table (processed), Aug. 1943.

Disastrous fires have taught the lesson that hazardous accumulations of fuel result from the exclusion of fire from southeastern pinelands. This point has been made by game managers but has not won easy recognition by the foresters. The present circular should go a long way toward bridging the gap between the views of these groups, and it is to be hoped will lessen the threat of legislative restrictions upon controlled burning. Dangers and benefits are discussed and suggestions are made as to analyzing the need for burning, and planning and conducting the operation. The approach is entirely from the forestry standpoint.

Management: Environmental improvement

Good, E. E., and C. A. Dambach. Effect of land use practices on breeding bird populations in Ohio, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 291-297, 3 tables.

A preliminary report by the same authors was abstracted in WILDLIFE REVIEW, No. 26, Feb. 1940, pp. 30-31. The present article includes records from two additional years of census work in the original locality (southwestern Ohio) and from three in a new one (southeastern Ohio). Differences in these environments are described and discussed. The pairs of birds, counted from singing males, are tabulated for crop and pasture lands and woods in the two localities. A summary table shows the changes in bird population following the application of soil-conserving practice; there was a net average increase of 41.5 percent. The most important factors responsible for the increase are: "(1) Fewer acres clean-tilled and in small grains (which support small populations of breeding birds) and a corresponding increase in the acreage with permanent vegetation; (2) more acres in meadow, which support higher populations of breeding birds; (3) breaking large crop fields into narrow, alternating strips of different crops resulting in an increase in the number of acceptable territories for field-nesting birds; (4) increased acreage of managed pastures, which support higher populations of breeding birds than poor pastures; (5) material increase in acreage of protected woodlands, which support about twice as many birds as grazed woods."

Management: Environmental improvement

Osborn, Ben. Wildlife and habitats in Young County, Texas, by a new method of survey, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1,00 a copy), 7(3), July 1943, pp. 241-256, 1 fig., 6 tables.

The survey described may be characterized as a rapid reconnaissance adapted from more time-consuming procedures. The methods followed are briefly discussed and their sources indicated in a list of 40 titles of literature cited. Sample plots, their obvious animal inhabitants, and plant food and cover, were the elements considered. The results are tabulated and discussed and their use in appraising quail and other habitat pointed out. Probable former, and observed present, conditions are compared and suggestions are made as to the management of wildlife environment.

Management: Farmer-sportsman relationship

Armfield, R. B. The future of North Carolina quail hunting, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh), 7(5), May 1943, pp. 3-4, 15.

Factors detrimental to quail are listed and discussed; preservation and improvement of environment is needed and, under existing conditions, the farmers are the only ones who can accomplish this; they can not afford to do it without reimbursement, which should come from the sportsmen. "The best quail shooting in the State at present is . . . on . . . preserves which have been leased from the farmers. The farmer is paid 10 cents per acre per year for the quail hunting rights."

Management: Farmer-sportsman relationship

McDuffie, Ronald C. Attitude of Palouse farmers towards farm game Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, p. 343.

From interviews with 133 farmers mostly on wheat ranches, averaging 320 acres in size, the author concludes: "Only three farmers were in favor of feeding the birds in one way or another. In general, they felt that, to them, the feeding operations would not be worth the loss of crop or the trouble of leaving a portion. The bother of obtaining some form of payment did not appeal to them, probably reflecting the rather high average net annual income which exceeds $2,000. My impression of their attitude toward game and hunting is that they are mainly unconcerned about what happens as long as hunters do not hunt too close to buildings or livestock. The farmers take little interest in game. Poaching is negligible and the birds are not molested if they do not interfere with farm operations. On the other hand, the farmers do nothing to encourage the birds."

Management: Forest management and wildlife management

English, P. F. Forestry and wildlife management, American Field (222 West Adams St., Chicago, Ill. 20 cents a copy), 140(28), July 10, 1943, pp. 28-29.

"Accepted forestry practices need be modified only in very minor details in order to maintain woodlands in the best possible conditions for wildlife and forestry." The classification of game in the American Game Policy of 1930 is followed and the principal groups named. Multiple use forestry is defined, and block cutting recommended as favorable to wildlife. The importance of inventory and also of appropriate harvesting is recognized. Ways are suggested in which silviculture may be directed to the benefit of wildlife. Caution in predator control is advised. The ecological approach is recommended.

Management: Grouse, Ruffed

King, Ralph T. Ruffed grouse management, Roosevelt Wildlife Bulletin (Roosevelt Wildlife Forest Expt. Station, Syracuse, N. Y.), 8(3), April 1943, pp. 59-80, Figs. 6-14, table 2.

Reprint (with additional illustrations) of an article of the same title from the Journal of Forestry, 35(6), June 1937, pp. 525-532, which was abstracted in WILDLIFE REVIEW, No. 9, July 1937, p. 30.

Management: Hedgerows

Steavenson, Hugh A., Harry E. Gearhart, and R. L. Curtis. Living fences and supplies of fence posts, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 257-261, 1 pl., 1 fig., 1 table.

A timely article because of the limited supply of barbed and woven wire that can now be spared from the war effort. Hedgerows of suitable woody vegetation afford ideal travel lanes and food patches for wildlife, and fields with hedges may support 60 percent more pheasants than those enclosed by wire. The hedges provide food and shelter also for song birds. In seeking for a plant with the essential qualifications for a living fence, members of the Soil Conservation Service believe that an Asiatic rose (Rosa multiflora) is the most promising. It has excellent cover qualities, produces quantities of fruit which persists throughout the winter, is easily and economically grown, and provides good bufferstrip qualities when used as a barrier on a contour. It has the useful, and lacks some of the objectionable, qualities of osage-orange. For growing fence posts in the places where they are to be used, red cedar is recommended. Production of posts and firewood in hedgerows has proved economically justifiable in Illinois and Missouri.

Management: Herd regulation

Cahalane, Victor H. Elk--food--andwinter, Outdoor America (18th Floor La Salle Hotel, Chicago, Ill. 10 cents a copy), 8(3), Feb. 1943, pp. 4-5, 16, 5 photos.

The numbers of the northern Yellowstone elk herd are about a third beyond the carrying capacity of their range. Regulation of the herd has been a problem for more than 30 years, mainly due to occupation of former winter range adjacent to the Park boundaries. Feeding areas within the Park have been damaged by overuse and by drought and are restricted in winter by heavy covering of snow. Trial of artificial feeding increased rather than diminished the difficulties. Efforts to obtain additional winter range, being blocked, herd reduction was resorted to and in 8 years 16,682 of the animals were removed. Nevertheless the herd maintained nearly its original number. More drastic measures eliminated 7,230 individuals in 1942-43. Such regulation is the only practical means of "maintaining a healthy herd of elk, restoring the greatly damaged range, and bringing the deer, antelope, bison, and bighorn back to a safe position in the Park fauna."

Management: Herd regulation

Cahalane, Victor H. Elk management and herd regulation, Outdoor America (18th Floor La Salle Hotel, Chicago, Ill. 10 cents a copy), 8(5), April, May, June, 1943, pp. 29-31.

This paper relates principally to the northern Yellowstone elk herd. See preceding abstract.

Management: Inventory, antelope

Anon. Wyoming has large pronghorn antelope population, Wyoming Wild Life (Wyoming Game & Fish Dept., Laramie), 8(6), June 1943, pp. 1-3, 10-15, 2 photos, 1 col. map.

Some 54,000 (about one to a square mile on the areas occupied) by present estimate, the means of making which are described. The history of antelope populations in the State is reviewed and management efforts are outlined. The 1942 kill is assigned a value of $72,000. The counts and estimates are tabulated by counties, and numbers per square mile indicated on a colored map which also shows the areas in which differential bag limits will be in effect in 1943.

Management: Inventory, bobwhite

Bennitt, Rudolf. Summer whistling cocks and the fall harvest--a relationship, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 4(4), July 1943, pp. 1, 12, 1 photo.

There is a fair correlation between the number of whistling bobwhites heard in midsummer and the fall population as indicated by hunting success. Counts of the whistling cocks appear to be a practical means of roughly estimating the abundance of the birds.

Management: Inventory, upland game birds

Bach, Roy N. The recent history and status of the four principal species of North Dakota upland game, North Dakota Outdoors (North Dakota Game and Fish Dept., Bismarck. 5 cents a copy), 6(1), July 1943, pp. 12-13, tables.

Tables show estimates for 5 years for the ring-necked pheasant, Hungarian partridge, sharp-tailed grouse, pinnated grouse, all grouse, and all of these upland game birds together under the following heads: Kill per hunter, number of hunters, hunter kill, roadside count, total population, natural loss, and surviving breeding stock. The pheasant and sharp-tailed grouse populations have steadily increased during the period; that of the partridge did likewise except in the last year. Prairie chicken numbers have fluctuated but are larger than those of 5 years ago. "The bird was not originally a native of this state." [If this is true, the A.O.U. Check-List stands in need of correction.] The estimated hunter kill is about 10 percent, which the author considers "practically negligible" so far as effects upon the total populations are concerned.

Management: Land planning for wildlife

Weeks, David, A. E. Wieslander, H. R. Josephson, and C. L. Hill, Land utilization in the northern Sierra Nevada, University of California Agricultural Expt. Station (Berkeley) Special Publ., 127 pp., 24 figs., 17 maps, 14 tables (processed), 1943.

Among the uses discussed are those of recreational and wildlife resources (pp. 104-106). Summer deer ranges in the higher elevations are usually adequate but acute competition occurs between the deer and domestic sheep and cattle on the lower winter ranges. Sufficient areas of summer range have been set aside as refuges and public acquisition of areas of winter range has been proposed as a desirable step in wildlife management. Some herd regulation also appears to be required. Many thousands of hunters visit national forests of the region and about 2,000 trappers operate there. Private land holdings abound but hunting upon them has not been reduced to an approved system. Improvement is expected under the provision of a recently passed California Game Management Act. "Major proposals for improvement of the environment . . . include the maintenance of an interspersion of cover types, or 'edge environment,' improvement and development of natural and artificial water supplies, and control of ground squirrels."

Management: Nest boxes

Brown, Louis G., and Frank C. Bellrose, Jr. Use of nesting boxes for wood ducks by other wildlife, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 293-306, 1 pl., 4 tables.

Authors' summary: "(1) Approximately 800 nest boxes of boards were erected by the Illinois Natural History Survey and 400 slab boxes by the U. S.

Fish and Wildlife Service. All were inspected during the winter and spring seasons of 1939, 1940, and 1941, to determine their use by species other than wood ducks; (2) in all 9.1 per cent were occupied when inspected, and 26.4 per cent had been used recently. Fox squirrels occupied 3.3 per cent, screech owls 2.9 per cent, raccoons 0.9 per cent, opossums 0.5 per cent, gray squirrels 0.3 percent, and other species 1.1 per cent; (3) between boxes in upland and floodplain habitats there was no significant difference in utilization by all species studied except the raccoon. The placing of boxes, particularly in floodplain habitats, is believed to have increased the carrying capacity for cavity-dependent species; (4) the boxes were used most frequently by the species studied during the winter as shelter sites. Spring use was generally lower, due probably to a greater relative abundance of sites for rearing young; (5) the species studied were no more numerous in refuge areas than in non-refuge areas of equivalent size, except the raccoon, the populations of which [were] unusually high on refuge areas; (6) it is believed that regular inspection of den boxes, under similar phenological and climatic conditions, will indicate local fluctuations in populations of cavity-dependent species."

The boxes and the habitats in which they were placed are described. Remains of screech owl prey found in 159 boxes are tabulated; they were chiefly of birds. Utilization of the boxes by the principal intruding species is fully discussed.

Management: Overpopulations, deer

Feeney, W. S. Wisconsin deer today and tomorrow, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 8(8), Aug. 1943, pp. 11-19, 5 photos.

The author discusses proposals that have been made for alleviating the problems connected with deer overpopulation in Wisconsin, reports upon the situation, and makes recommendations for controlling it. More than 2/3 of the winter concentration areas in the northern part of the State are heavily overbrowsed and in 3/4 of them the deer are eating more than the current growth of food. The number of dead deer found in one season was 1,300 but this was probably only a fraction of those which actually died as a result of malnutrition. Anyone can recognize serious overutilization of range but experts are needed to detect the danger signs so that remedial measures can be taken before the critical stage is reached. Keeping herd numbers in balance with carrying capacity is the only remedy. It is better to overdo shooting than to attempt to carry too many deer. It is much easier to replenish the herd than it is to restore damaged range.

Following this paper (pp. 19-22) is the "Majority report of the Citizen's Deer Committee to Wisconsin Conservation Commission" (Aldo Leopold, Chairman), which sets forth the deplorable condition of the deer yards, the trend of starvation of deer, damage to forest plantations and to natural reproduction, and advises herd reduction. It discusses also the need for local treatment of the problem, of moderation of predator control, and of research and education. The vote of the Committee on eleven questions of policy is tabulated.

Management: Personnel

Wing, Leonard. Employment in the wildlife field, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 261-270, 5 tables.

Summary of an investigation by questionaries. The total number of fish and game employes (clerical excluded) in 51 States and Provinces was 5,594; Michigan ranked first with 415. Overall estimated total 6,362. The average department is composed of 109.7 permanent, and 27.4 seasonal, employes. Of these, 5.9 percent are administrators, 57.7 law enforcers, 5.9 game farm operatives, 18.7 fish culturists, and 6.5 percent biologists. Only 9.7 percent have special training. Salaries tend to be low in relation to the duties and responsibilities. Analyses of replies to 9 key questions are presented. Reports from schools giving professional training in wildlife work are summarized. Under conditions prevailing in 1941, graduates with a bachelor's degree got immediate employment to the extent of 48 percent; master's degree, 72 percent; and doctor's degree, 100 percent. Allowing for a 15 percent turnover, about 1,000 positions must be filled annually, but under present policies, not to exceed 10 percent of these come into the "trained" class. Conservation departments are "slow in taking advantage of the opportunity to obtain trained men."

Management: Planting bitterbrush

Hormay, August L. Bitterbrush in California, U. S. Forest Service, California Forest and Range Experiment Station (Berkeley), Forest Research Note 34, 13 pp., 3 pls., 2 tables (processed), June 1943.

"Bitterbrush (Purshia tridentata D. C.) is one of the most important range plants in the West. It is grazed by cattle, sheep, and goats, as well as by deer, antelope, and other game animals, and the seeds are an important item in the diet of rodents and birds." In this excellent account, the plant is described and figured, its vernacular names cited and explained, and its distribution mapped. Its growth and reproduction and factors influencing them are thoroughly treated. The author believes that most of the natural reproduction is from seeds cached by rodents, and in view of the value of the plant, that destruction of seed-caching rodents would be detrimental to the propagation of this important forage species. Under present conditions, bitterbrush is overbrowsed by both deer and cattle. Burning destroys the plant and makes reproduction difficult. Planting is practicable and directions for it are given. "Rodents are known to carry seed as far as 200 yards from the nearest bitterbrush plants, but they cache intensively usually within only 100 feet of the seed supply. Therefore planting-strips 10 to 20 feet wide spaced about 200 feet apart should provide ample plants and seeds for future caching in the interspaces."

Management: Planting wildrice

Miller, Herbert. Wild rice in Michigan, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 12(5), June 1943, pp. 4-5, 2 photos, 1 table.

Reasons for failure of most of the plantings are discussed; the most important appears to be fluctuation in water levels. "Much current wild rice planting is considered inadvisable because of the likelihood of failure, the absence of a need for the rice in most cases, and the conflict with other recreational interests that may be expected if the plant thrives too well. Plantings could best be confined to specially selected sites, after thorough investigation. Indiscriminate, impromptu plantings ought not to be encouraged."

Management: Range

Miller, Paul. Big game--winter range, Outdoor America (18th Floor La Salle Hotel, Chicago, Ill. 10 cents a copy), 8(5), April, May, June, 1943, pp. 28-29.

The future of vegetarian big game depends upon our ability to acquire, to manage, and properly to control adequate areas of winter range.

Management: Range

Pickford, G. D., and Elbert H. Reid. Competition of elk and domestic livestock for summer range forage, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 328-332, 1 table.

Shortage of summer forage, in part due to an increasing number of elk, is a limiting factor upon livestock production in eastern Oregon and Washington. The study here reported upon was made to determine the nature of the competition between sheep and elk. It is keen for the choice forage plants. A relatively small number of plant species produces the bulk of the forage used by both groups of animals. Unfortunately some of the favorite forage plants are important soil-stabilizing species, the excessive removal of which accelerates erosion. If animals are to be removed to remedy the effects of erosion, excluding the sheep alone will not produce the desired result. The table shows the estimated herbage production of a large number of summer range plants and their use by sheep and elk. Bibliography of 7 titles.

Management: Range

Scott, John W. Domestic livestock on federal lands, Outdoor America (18th Floor La Salle Hotel, Chicago, Ill. 10 cents a copy), 8(5), April, May, June, 1943, pp. 26-28.

In discussing the relationships of livestock and big game, the author states that the game animals reached a low point in the West about 1900 but have been increasing ever since. Livestock also has multiplied and now outnumbers the big game 35 to 1. Competition has been made more severe, therefore, chiefly by increase in stock. The cost of running domestic animals is greater on wildlife ranges than on public grazing lands, but fees for use of the latter should be raised until they are approximately equivalent to the cost of production on private lands. That would reduce overstocking, hence competition, and would be favorable to wildlife.

Management: Refuges

Mitchell, Earl T. The Horicon Marsh wildlife area, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 8(6), June 1943, pp. 6-9.

Speculation as to the original characteristics of the area and comment on its flooding, drainage, and restoration, including its development as a wildlife area. Notes on the more important game and other bird visitants.

Management: Seal, Fur

Bower, Ward T. Alaska fishery and fur seal industries: 1941, Fish and Wildlife Service, U. S. Dept. of the Interior, Statistical Digest No. 5 (Supt. of Documents, Washington, D. C. 15 cents a copy), 71 pp., 37 tables, 1943.

The take of fur seal skins on the Pribilof Islands was 95,013, the largest since 1889; disposition of, and receipts for, the skins and of oil and meal made from the carcasses are recorded. The publication contains notes on the fox industry (834 pelts taken) and of the reindeer herd on the Islands. The annual computation of the number of fur seals by Edward C. Johnston is presented on pages 60-71. The total number estimated was 2,338,312, an increase during the year of 7.01 percent.

Management: Stocking, pheasant

Tubbs, Farley F. Pen-reared pheasants can't compete, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 12(4), May 1943, pp. 8-9, 1 photo, 2 tables.

Banding returns show that released pen-raised birds do not live long and do not contribute significantly to the annual take. Assessing the costs of rearing the released birds against the number harvested, State expenditure for each of the latter was $16.20. "Yet the demand for pen-reared birds continues with undiminishing insistence."

Management: Strip mine areas

Bristow, James W. Wildlife havens from strip mines, Outdoor America (13th Floor La Salle Hotel, Chicago, Ill. 10 cents a copy), 8(5), April, May, June, 1943, pp. 42-44.

Land mined by stripping at first looks beyond reclamation, but nature in time covers the areas with vegetation, the man-made valleys hold water, and aquatic plants come in. Rehabilitation can be hastened, however, and has been aided on a large scale in Illinois by planting trees, shrubs, and herbs that provide food and cover for wildlife, and development of water areas. Game birds have been stocked and are safer in this rough terrain than elsewhere. Public ownership or at least management is highly desirable.

Management: Turkey

Blakey, Harold L. Establishing pen-reared wild-turkeys, Modern Game Breeding (28 W. State St., Doylestown, Pa. 25 cents a copy), 13(8), Aug. 1943, pp. 4-6, 13, 1 photo, 1 map.

"No individual or agency has yet produced a continuous supply of wild turkeys for stocking that compares favorably in essential respects with the pure strain native wild bird." Although stocking projects have been undertaken within recent years in 19 states, they have with rare exceptions "failed to re-establish the turkey on a self-sustaining basis." However, the writer believes "that, given an adequate area in a fundamentally suitable range and a reasonable control over the factors that affect wild turkey welfare, any wild turkey stock may be so managed as to produce a wild bird and a good shooting resource within five years." The basis for this belief is the success attained in management of pen-reared wild turkeys and control of environment on Port Royal Island, S. C. The characteristics of the area, objectives of land management, and range management for turkeys are set forth and the history of the wild turkey population discussed under the following heads: Stocking, population increase, overflow, and character of the stock. Success due to field management, significance of the project, capacities of areas for management, and a program of wild turkey management also are treated.

Management: Turkey

Leopold, A.Starker, and Paul D. Dalke. The 1942 status of wild turkeys in Missouri, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 41(6), June 1943, pp. 428-435, 2 maps, 2 tables.

The methods of inventory are described and the results tabulated and discussed. The total number of birds is 4,340. The effects of soil, topography, and land use upon turkey populations are set forth. The values of legal protection, refuges, and restocking in management are treated. Authors' summary: "A census of Missouri turkeys shows a slight increase in numbers but a decrease in occupied range during the past decade. The heaviest populations occur on lime soils with frequent 'balds', the lowest on granitic soils. Overgrazing, overburning, slashing, and poaching are believed accountable for the decline of the species. Relief from poaching has produced prompt local gains. Remnants of native stock have responded much better to refuges than [have] plantings of game-farm birds. Refuges must be free of disturbance to be effective." Bibliography of 10 titles.

Management: Winter feeding

Bishop, Robert J. Winter feeding station tests of grains in Washington, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 344-345, 1 fig.

Experiments conducted during the winter of 1941-42 to test the palatability of various cultivated grains in the winter feeding of ring-necked

pheasants and Hungarian partridges revealed that more wheat was consumed than any other single grain, whole corn ranked second, and scratch feed third.

Management: Winter feeding

Gerstell, Richard. The place of winter feeding in practical wildlife management, Pennsylvania Game Commission (Harrisburg) Research Bul. 3, 121 pp., 20 figs., 30 tables, 1942.

The scope of this paper is greater than indicated by the title as it includes reports on the author's experiments under strictly controlled conditions on the resistance to fasting of 15 common birds and mammals, and on the effects of fasting upon fecundity. Of the animals tested, the bobwhite, cottontail, and muskrat proved to have less ability than the others to withstand the effects of hunger and cold. Winter food shortage may adversely affect reproduction in the bobwhite but did not appear to do so in the pheasant and mallard. Powers of grit retention are so great as to protect pheasants and quail from ill effects for periods of deprivation as long as two months. The history, needs, and methods of winter feeding are fully discussed and a finely-printed 4-page bibliography presented. The author concludes, "That as presently carried out, the disadvantages of winter feeding, particularly its ineffectiveness and its inefficiency, outweigh its advantages." Emphasis should rather be placed on augmenting permanent sources of natural foods.

Natural History: Amphibians of British Columbia

Carl, G. Clifford. The amphibians of British Columbia, British Columbia Provincial Museum (Victoria), Handbook No. 2, 62 pp., illus., June 1943 (25 cents a copy).

Introductory pages discuss the characteristics, life history, structure, voice, neoteny, regeneration, poisonous qualities, distribution, and economics of amphibians, as well as superstitions about these animals and their representation in folk-lore and art. Keys to the species are presented and each has an illustration and text containing a description and notes on distribution, habits, and habitat. The excellent figures by Francis L. Beebe indicate that the air brush is particularly well adapted to the picturing of amphibians.

Natural History: Bear liver poisonous

Rodahl, K., and T. Moore. The vitamin A content and toxicity of bear and seal liver, Biochemical Journ. (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 12 shillings, 6 pence a copy), 37(2), July 1943, pp. 166-168.

Reference is made to reports by Arctic explorers of food poisoning through eating liver of the polar bear. Testimony of similar purport relative to the bearded seal also exists. These materials were given laboratory tests by feeding them to rats. Authors' summary: "(1) Specimens of the livers of the polar bear and the seal, Phoca barbata, were found to be very rich in

vitamin A. Three specimens of bear liver contained 18,000, 18,000 and 13,000 i.u./g. [international units per gram], respectively, of wet material. A specimen of the seal liver contained 13,000 i.u./g.; (2) the ingestion of excessive amounts of bear liver by rats led in one instance to fatal hypervitaminosis A. Other rats which ate slightly smaller amounts of liver showed no obvious sign of injury. The well-known poisonous action of bear liver in man is probably due to its high content of vitamin A." Ten references to literature.

Natural History: Birds of Wisconsin

Jackson, Hartley H. T. Summer birds of northwestern Wisconsin, Passenger Pigeon (W. E. Scott, Conservation Dept., Madison, Wis.), 3(10), Oct. 1941, pp. 87-90, 1 fig. (map); 3(11), Nov. 1941, pp. 95-98, 1 photo; 3(12), Dec. 1941, pp. 103-106, 1 photo; 4(2), Feb. 1942, pp. 9-12; 4(4-6), April-June 1942, pp. 37-39, 2 photos; Old Series 4(10-12), N. S., 4(4), Jan. 1943, pp. 91-95, 1 photo; 5(2), July 1943, pp. 24-35, 2 photos (one a snapshot of the author and Vernon Bailey), 1 table.

Annotated list; notes on stomach contents of pigeon hawk, sparrow hawk, and upland plover; and field observations on food of crow, cedar waxwing, and bronzed grackle.

Natural History: British Columbia

Stanwell-Fletcher, John F., and Theodora C. Stanwell-Fletcher. Some accounts of the flora and fauna of the Driftwood Valley region of north central British Columbia, Occasional Papers B. C. Provincial Museum (Victoria, B. C., Canada), No. 4, 97 pp., 5 pls. (processed), 1943.

Of interest to most readers of WILDLIFE REVIEW chiefly for its annotated lists of vertebrates, reporting good observations in an out-of-the-way locality.

Natural History: Mammals of Colorado

Warren, Edward R. The mammals of Colorado, University of Oklahoma Press (Norman. $4.00 a copy), xviii+330 pp., 50 pls., 1942.

This posthumous publication fortunately had the attention of the author up to the galley-proof stage and thus has the authority of his unrivalled knowledge of its subject. It contains keys for identification of practically all of the forms treated and gives their technical and vernacular names, measurements, description, distribution, Colorado records, and miscellaneous notes. The latter are especially full for economic species and include much historical lore relating to the fur and game animals. The book includes 11 pages of bibliography, a glossary, and an index. A very satisfactory state manual.

Natural History: Mammals, Small, of New Brunswick

Morris, R. F. The small forest mammals of New Brunswick and the Gaspe, Acadian Naturalist (Natural History Society, University of New Brunswick, Fredericton, N. B., Canada), 1(1), May 1943, pp. 27-42, 1 photo.

Annotated list of 18 species and subspecies of shrews, mice, squirrels, and skunk (1). Food habits receive particular attention, especially in relation to the spruce sawfly (Gilpinia hercyniae), more than 50 percent of the cocoons of which are sometimes destroyed by shrews and rodents. See also abstracts: Food Habits: Natural control of spruce sawfly, p. 18, and Rodents vs. spruce sawfly, p. 19.

Natural History: Mammals of Quebec

Anderson, Rudolph M. Two new seals from arctic Canada with key to the Canadian forms of hair seals (Family Phocidae), Ann. Rep. Provancher Society of Natural History (140 St. John St., Quebec, Canada), 1942 (1943), pp. 23-34 (French version, pp. 35-47).

Key to 3 genera and species and to 3 subspecies of each of two of the latter. Description of two subspecies as new: Phoca hispida beaufortiana and P. h. soperi from northwestern and northeastern arctic Canada, respectively.

This paper is followed by one entitled "Nine additions to the list of Quebec mammals with descriptions of six new forms." (English text, pp. 49-62; French, 63-77.)

Natural History: Snakes, Poisonous, of Louisiana

Cowanloch, James N. Poisonous snakes of Louisiana, Louisiana Dept. of Conservation (New Orleans), 63 pp., fully illus., 1943.

Well written by one who appreciates the good points of snakes as well as the bad, this article discusses popular beliefs about serpents, the incidence of snake bites, and the effects of the venoms, gives explicit and up-to-date information (supplemented by a photograph of equipment) for treatment of snake bite, and lists, illustrates, and describes the venomous species of Louisiana. There is a 3-1/2 page bibliography.

Bound in the same booklet are articles on the black widow spider and on the poisonous plants of Louisiana.

Natural History: Speed of mammals

Cottam, Clarence, and C. S. Williams. Speed of some wild mammals, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(2), May 1943, pp. 262, 263, 1 table.

Records for 13 groups timed by automobile speedometers.

Natural History: Waterfowl of Iowa

Musgrove, Jack W., and Mary R. Musgrove. Waterfowl in Iowa, State Conservation Commission (10th & Mulberry Sts., Des Moines, Iowa. $1.00 a copy), ix+113+ix pp., 8 col. pls. + other illus., 1943.

Accounts, headed by names and range of lengths and weights, and including brief notes on appearance, field marks, call, breeding range, migration, winter range, nesting, food, and Iowa status are given for 2 species of swans, 6 species and subspecies of geese, and 29 of ducks. Additional chapters discuss: Seasonal and individual variation in plumages, migrations and flyways, enemies of waterfowl, and lead poisoning. The book includes also a list of forms of accidental or hypothetical appearance, keys to the species, glossary, and index. The illustrations by Maynard F. Reece, both in color and in black and white, reveal an artist of considerable talent. A book that is sure to prove very useful to all Iowans interested in waterfowl.

Predation: Mink

Errington, Paul L. An analysis of mink predation upon muskrats in north-central United States, Iowa Agr. Expt. Sta. (Ames) Research Bul. 320, pp. 797-924, 16 figs., tables, June 1943 (August).

This extended report summarizes intensive work by the author since 1934 and incidental observations in earlier years. The former phase had Iowa as its locality, and the latter, principally South Dakota. The work is rightly termed an analysis as it gives full attention to philosophical considerations based on field work of the highest quality. The author gives ample information on background and methods of the study, discusses the principal factors that affect mink predation upon muskrats, and emphasizes intercompensatory aspects of this predation. From the author's summary, the following extracts are illustrative as to phases of mink predation.

"(a) Upon mature or maturing muskrats during spring dispersal from wintering to breeding quarters. Remains of muskrats may often, if not usually, be conspicuous about marshy mink retreats in April and May, but the evidence is that the victims are chiefly surplus, unmated, strife-battered, wandering males--a part of the population that is typically lost in many localities, irrespective of whether through predatory enemies, intraspecific strife, or other factors. (b) Upon breeding populations of muskrats. Adults established in familiar 'territories' suffered slight loss from natural enemies unless placed under overwhelming disadvantage by drouth emergencies or the like; even on dry marshes hunted over by minks and foxes, some old muskrats were able to live on and on during the warmer months. (c) Upon young muskrats. The immature animals were observed to suffer most from depredations of minks when drouth conditions were acute and when states of overpopulation prevailed in their habitats. The only type of loss from minks that did not appear to be decidedly intercompensatory was among muskrat litters in the vicinity of mink dens, and only for one season and for a small part of one area do the data indicate a net depressive influence on population recovery of the muskrats. The heaviest losses of young accompanied rather than governed the directions

taken by population curves. If populations of young were basically insecure, their losses tended to occur through several agencies, singly or combined. When mink predation was severe, other losses had a tendency to diminish in proportion; lessening of mortality through predation was largely counterbalanced by increased killing of young by older muskrats or by acceleration of miscellaneous losses . . . (d) Upon late summer and early fall muskrat populations. The interim between the end of the breeding season in late July and August and the hard frosts of late September and October was one of minimal intraspecific friction in muskrat habitats under observation. Known mink predation was light at this season except that upon drouth exposed muskrats and upon those which for any reason had fallen into hazardous wanderings. (e) Upon wintering muskrat populations. Vulnerability to minks of the drouth-exposed and the transient muskrats was pronounced during cold weather but such animals were from one cause or another so inevitably doomed--actually dying more from intraspecific attack, hunger, and cold than from predation in instances closely studied--that the exact medium of their elimination in the end made scant difference, biological or otherwise."

Suggestive extracts from the philosophical discussion are: "It seems highly probable that the more prolific a race is the more predation it will draw, which is a different thing from keeping ahead of its enemies through sheer rapidity of increase." "For the majority of low to moderate density muskrat populations observed in the course of the Iowa researches, recovery during 'normal' breeding seasons tended to be more or less predetermined by intraspecific and habitat factors, irrespective of the average numbers of young born per female and the population status of such predators as minks." "If any factor in the ecology of north-central muskrats has a selective influence, I should think that would be drouth, but I would hesitate to say how selective that may be." "Mink predation . . . for all of its occasional deadliness to young and handicapped muskrats, does not have the sort of action I would expect of a highly selective agency, and my inclination is to doubt that the muskrat would be a much different animal if its outstanding native enemy had never existed." Bibliography of 111 titles.

Propagation: Treatment of gapes

Wehr, Everett E., and Louis Olivier. The efficacy of barium antimonyl tartrate for the removal of gapeworms from pheasants, Proc. Helminthological Soc. Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md.), 10(2), July 1943, pp. 87-89, 1 table.

Report on tests of this powder on several groups of young pheasants. The results were satisfactory.

Research: Age determination

Linduska, J. P. A gross study of the bursa of Fabricius and cock spurs as age indicators in the ring-necked pheasant, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(3), July 1943, pp. 426-437, Pl. 2, 7 figs., 1 table.

Well-illustrated report on studies in Michigan leading to satisfactory procedure for distinguishing birds of the year from older individuals. References to earlier demonstrations of the bursa of Fabricius as an age indicator omitted from this and other recent papers on the subject include: Jolly, T. Compt. rend. Soc. de Biol. 75, 1913, p. 638; Arch. Anat. Micr. 16, 1914, p. 363; and Riddle, Oscar. Amer. Journ. Physiol. 86, 1928, p. 248.

Research: Control

Garlough, F. E. Some of the latest developments in the control of rats and mice, Pests and Their Control (512 E. 14th St., Kansas City, Mo. 25 cents a copy), 11(1), Jan. 1943, pp. 6-7, 9, 3 tables.

Notes on the kinds of rats that require control and their preferences among ordinary bait materials. Norway rats select foods with a high fat content while the others prefer vegetables and fruits. The formula of a readily and continuously accepted bait for the Norway rat is given and also a table, by the aid of which, materials can be selected for a bait that will have an attractive combination of fats, proteins, and carbohydrates. The effects of war conditions upon the supply of several toxic substances is discussed; some remain available and search for substitutes for the others is in progress. The results of investigations of repellents are summarized. Bibliography of 8 titles.

Research: Kangaroo rats in relation to earth structures

Compton, Lawrence V., and R. Frank Hedges. Kangaroo rat burrows in earth structures, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 306-316, 4 figs., 3 tables.

The data presented were gathered from June to October 1940 in New Mexico. Authors' summary: "(1) The burrowing activities of kangaroo rats were studied in relationship to the design and operation of contour furrows, contour dikes, and stock pond dams; (2) dens of the Ord kangaroo rat (Dipodomys ordii montanus) were found in all three; those of the banner-tailed kangaroo rat (D. spectabilis baileyi) only in dams; (3) the burrows of ordii have no harmful effect upon contour furrows and may increase their efficiency by allowing more water to enter the soil; (4) in contour dikes, their burrows endanger the structure by providing channels in which water may flow through the dike; (5) in stock pond dams, neither species perforated the fill below the freeboard. On the faces of these dams, the burrows of ordii penetrated the fill to a vertical depth of 2 feet, and those of spectabilis to 5 feet. The burrows on the upstream face do not affect the line of saturation but those near the toe on the downstream face may intersect it; (6) the data suggest that: (a) an earth fill of 13 feet is about the maximum that may be perforated by either species; (b) spectabilis will not build dens on a site subject to flooding, but ordii returns to flooded sites after the water has receded; (c) damage to earth dams from perforation by kangaroo rats may be avoided by making the width of the fill, at the bottom of the freeboard, exceed 13 feet; and (d) a well designed dam normally has the line of saturation well within the fill where it would not be intersected by kangaroo rat burrows."

Research: Kellogg Bird Sanctuary

Pirnie, Miles D. The W. K. Kellogg Bird Sanctuary in wildlife researches, Modern Game Breeding (Doylestown, Pa. 25 cents a copy), 13(7), July 1943, pp. 6, 13, 1 photo.

Brief history and description of the Sanctuary; a notable achievement was large-scale nesting colonization of Canada geese. Researches on fishes, rabbits, waterfowl, and small birds are mentioned. Moderate predator control has proved satisfactory in maintaining the Sanctuary. Library, collection, and other facilities are noted.

Research: Shipping crate for rodents

Arnold, Lee W. An effective shipping crate for desert rodents, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 345-346, 1 fig.

Made from one-gallon tin cans and an orange crate; description, illustration; directions for use.

Research: Trapping deer

Webb, William L. Trapping and marking white-tailed deer, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(3), July 1943, pp. 346-348, 2 figs.

A new type of trigger for the Stephenson deer trap is described and illustrated. It functions well even in severe winter weather. Objections to trapping as a research method; ear-tagging and dye-marking also are discussed.

SPECIAL ARTICLE

Recent publications on falconry

Copies have only recently been received of "The American Falconer," journal of The Falconers' Association of North America. It is a quarterly, now in the second volume, and it may be obtained from Dr. Robert M. Stabler, Glen Mills, Pa. The subscription price (including membership in the Association) is $3.00 a year. The magazine is a good source of references to magazine articles and books on raptors. It contains some information on natural food habits, viz.: Prairie falcon, 1(4), Jan. 1943:12-13; duck hawk, ibid.: 16.

It seems not generally known that there is a popular American book on falconry. The following, "Falconry: A handbook for hunters," by W. F. Russell, Jr., with photographs and drawings by W. D. Sargent (Charles Scribner's Sons, 597 Fifth Ave., New York, N. Y. $2.50 a copy), is described by the publisher as "an exposition of the art of falconry, its practice in earlier times and the procedure to be followed today. The birds used in falconry are fully described along with necessary details as to care and training. Chapters are devoted to the methods of trapping falcons, the terrain to be selected, and

the various conditions of hunting. There are full descriptions of the implements used, a glossary of falconry terms, and a bibliography."

While on the subject of falconry, the appearance of a monumental work, which has been in preparation for years, may well be noted. It is entitled "The art of falconry," and is a translation by Casey A. Wood and F. Marjorie Fyfe of "De arte venandi cum avibus" by Frederick II of Hohenstaufen (1194-1250). The chief scene of Frederick's activities was in Sicily and southern Italy. He began his treatise with a general account of the structure and habits of birds in which he showed a definite tendency to get away from the custom of his time of compiling from folklore and supposed authorities and to base his remarks upon original observations. The six books of his work that have survived are translated and chapters are added by the translators or others on the available manuscripts, on the castles and hunting lodges of the Emperor, on quarters for falcons, diseases of the birds, methods of capturing birds of prey, falconry in modern times, birds of the chase probably well known to the Emperor, an annotated bibliography of works on falconry, and a glossary of terms used in the sport. The complete work runs to cvi+637 pages (8-1/2 x 11 inches), has 186 plates, and is a splendid specimen of the modern publisher's art. It may be had from the Stanford University Press, Stanford University, California, at $10 a copy.

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